

XVI. *On the external Anatomy and Natural History of the Genus of Annelida named Palolo by the Samoans and Tonguese, and Mbalolo by the Fijians.* By JOHN DENIS MACDONALD, Assistant-Surgeon of H.M.S. 'Herald,' employed on Surveying Service in the South-western Pacific, under the Command of Captain H. M. DENHAM, R.N., F.R.S. Communicated by G. BUSK, F.R.S., F.L.S.

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ON the examination of specimens of a remarkable *Annelidan*, obtained at the Navigator Islands (Samoa), and presented to the British Museum by the Rev. J. B. Stair, Dr. Gray founded a new genus, which he called *Palolo*, adopting the native name of the animal. It is thus characterized:—

“Body cylindrical separated into equal joints, each joint with a small tuft of three or four spicula on the middle of each side. Head? Last joint ending in a couple of tentacles. Eggs globular.

“*Palolo viridis*, n. sp. Green, with a row of round black spots down the middle of the dorsal? surface; one spot on the middle of each joint.—*Habitat*. Navigator's Islands.”

Dr. Gray found his specimens so mutilated, that he could not detect a single head amongst all the broken pieces; and consequently this essential part remained without description. He seems to refer his want of success in this respect to mere casualty. It is very remarkable, however, that we at first experienced the same difficulty, and only obtained a single head, though we carefully examined considerable numbers of this species in the Fiji Group, where it makes its short annual appearance at a period which the natives predict with unerring precision by observing the phases of the moon, as at Samoa. The comparison of specimens from both these localities proves them to be specifically identical; moreover, the Fijian name for the animal is *Mbalolo*, *Mb* in that language being substituted for the Samoan *P*.

The great antiquity of this name is attested by the fact, that the parts of the year nearly corresponding with our months of October and November are respectively named *Mbalolo lailai* (little), and *Mbalolo levu* (large). The latter, as its name implies, is distinguished by the appearance of the *Mbalolo* in such vast numbers, that it is collected by the natives as a dainty article of food, and is so much prized that formal presents of it are often sent considerable distances, from certain chiefs, to others whose small dominions do not happen to be visited by the *Mbalolo*. The Fijians entertain superstitious ideas connected with it; but further notice of these would be foreign to our present purpose.

Reverting to the separation or absence of the anterior extremity of the *Mbalolo* (as first noticed by Dr. Gray, and subsequently by us, in the specimens including different species) at the regular period of visitation, this fact is too remarkable to depend upon

coincidence or casualty. It would rather seem to indicate the fulfilment of some important end in the propagation of the species. Mr. F. M. Rayner suggested to me that the phenomena of reproduction in the case of *Tania* and *Bolhriocephalus* afford a curious parallel to the circumstance just alluded to with reference to the *Mbalolo*. The transverse fission in the latter case is evidently connected with the dispersion of the ova, rather than the development of new individuals from the pre-existing materials of the animal's body, as in *Nereis*, &c.

I had the good fortune to discover a single head of the *Mbalolo*,—and the only one to be found amongst a large bottleful of bodies and tails collected for me by my esteemed friend, the Rev. S. Waterhouse, Wesleyan Missionary, Fiji. The joints of the body, to the number of about twenty, remaining in connexion with the head, were considerably smaller than those that would succeed them were the specimen perfect; besides which, the *aciculi*, of two sorts, were more numerous in the little bundles springing from the lateral tubercles. The dark spots and characteristic markings of the dorsal surface were also very faint, or scarcely distinguishable. The head itself was very little narrower than the joints of the neck, blunt and rounded, with a slight emargination in front. Eyes two, placed one on either side of the upper surface, including, in the space between them, three conical tentacula, of which the central is the longest, and projects a little beyond the head. The mouth was inferior, subterminal, and armed with two pairs of jaws—those of the first pair being sickle-shaped and simple, and those of the second broad and jaw-like, having a curved external outline and a series of dental points on their opposable border. The tissues in the neighbourhood of the jaws appear to be much indurated; and one structure in particular is worthy of notice, that its true nature, if not already known, may be investigated in the neighbouring genera. It consists of two slightly diverging series of scale-like plates overlapping one another from before backwards, in which direction also they gradually increase in size. The free edges of the plates are directed backwards; and as distinct muscular bundles may be traced into their deep surface, it is highly probable that they are capable of elevation and depression, acting, so to speak, as a prehensile palate, opposable to the jaws.

The typical elements of the lateral appendages of the body-segments (often so distinctly seen in allied Annelida) appear to have become blended together, more or less, so as to form a single setigerous tubercle, transmitting, however, as is usual, two characteristic kinds of setæ, and bearing a simple papilla-like, dorsal cirrus above, and a somewhat smaller ventral cirrus below,—the former lying near the outer extremity of the tubercle, and the latter somewhat nearer the base. The repetition of these cirri may be traced backwards, through all the annuli, to the penultimate joint, in which they are quite suppressed; but both reappear in the anal segment, and the ventral cirri in particular, having attained considerable length, project posteriorly like those of better-known *Nereids*. Besides the supporting stylets of the feet (exhibiting so much sameness of character in all the Annelida furnished with them), the setæ of *Mbalolo*, as above noticed, are of two distinct kinds—one being of a very long slender and bristle-like form slightly compressed on the sides, twisted on its long axis, and terminating in an exquisitely fine point; while the other is much stouter and shorter, with a small claw-like terminal appendage having two

minute conical teeth on its concave edge. The bundles of *setæ* generally consist of two or three of each of these forms, the latter holding a position inferior to the former.

Mbalolo has been supposed to exhibit an alliance with *Arenicola*; but the anatomical characters above given refer it, very clearly, to the *Nereidæ*.

DESCRIPTION OF THE PLATE.

TAB. XLI.

- Fig. 1. Portion of *Mbalolo*. Natural size.
- Fig. 2. Magnified figure of the head, with its three frontal tentacula and eyes, each of which appears to consist of two distinct organs closely approximated. The position of the retracted jaws is shown in the central dark space behind the tentacula.
- Fig. 3. The double set of jaws, with their basal plates.
- Fig. 4. The palatal? erectile plates noticed in the text.
- Fig. 5. Three of the feet, seen from below: *a.* setigerous tubercle; *b, b, b.* dorsal cirri; *c, c, c.* ventral cirri; *d.* muscles which protrude the aciculi, acting through the basal stylet, *e*; *f.* retractor muscles, derived from the lateral border of a longitudinal muscular band, *g*, running along the ventral surface.
- Fig. 6. Posterior extremity of the *Mbalolo*, dorsal aspect: *a.* terminal dorsal cirri; *b.* terminal ventral cirri, or oval styles so called.
- Fig. 7. Basal stylet, or that which affords support to the lateral tubercles.
- Fig. 8. Whip-like aciculus.
- Fig. 9. Clawed aciculus.